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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,603	12/20/2001	Arie Cornelis Besemer	019219-011	3910

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EXAMINER	
MCINTOSH III, TRAVISS C 9	
ART UNIT	PAPER NUMBER
1623	

DATE MAILED: 03/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

File Copy

Office Action Summary	Application No.	Applicant(s)	
	09/913,603	BESEMER ET AL.	
	Examiner	Art Unit	
	Traviss C McIntosh	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 August 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims.

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3 & 8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Detailed Action

Acknowledgement is made of the preliminary amendment filed August 16, 2001 which affects the instant application by the following:

Original claims 3, 4, 6, 8, 9, and 14 have been replaced as indicated.

New Claim 15 has been added.

An action on the merits of claims 1-15 is contained herein below.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-9 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5, 7, and 11 of copending Application No. 09/913,596 ('596). Although the conflicting claims are not identical, they are not patentably distinct from each other because both applications claim a method of obtaining

nitrosonium ions by oxidizing a nitroxyl compound with an oxidizing agent in the presence of a transition metal and a complexing agent.

Independent claim 1 of the instant application and independent claim 1 of copending '596 both claim: a method of obtaining nitrosonium ions by oxidizing a nitroxyl compound with an oxidizing agent in the presence of a transition metal and a complexing agent.

Dependent claim 2 of the instant application limits the nitroxyl compound to a di-tert-nitroxyl compound, especially TEMPO. Dependent claim 2 of copending '596 limits the nitroxyl compound to a di-tert-nitroxyl compound. Dependent claim 11 of copending '596 limits the nitroxyl compound to TEMPO.

Dependent claim 3 of the instant application and dependent claim 3 of copending '596 limits the transition metal to manganese, iron, cobalt, nickel, copper or vanadium.

Dependent claim 4 of the instant application and dependent claim 4 of copending '596 limit the complexing agent to a nitrogen containing compound.

Dependent claim 5 of the instant application and dependent claim 5 of copending '596 limit the complexing agent to a bipyridyl or a triazonane or a (poly)histadine.

Dependent claim 6 of the instant application is drawn to a method of oxidizing a carbohydrate with an oxidizing agent in the presence of a nitrosonium ion produced by claim 1 as a catalyst. Dependent claim 7 further limits the carbohydrate to an alpha-glucan or fructan and dependent claim 9 limits the carbohydrate to a hydroxyalkylated carbohydrate or a glycoside. Independent claim 1 of copending '596 is drawn to a method of oxidizing cellulose in the presence of a nitrosonium ion which is produced by the same method as the instant application's method, as set forth supra. It would have been obvious to one of ordinary skill in the art that the

methods overlap substantially, as cellulose is a carbohydrate, and more specifically a glucan, and it is the primary alcohol function of the compound which is oxidized, not necessarily the compound as a whole. Likewise, providing the limitation of the carbohydrate being a hydroxyalkylated carbohydrate or a glycoside does not effect the primary alcohol function of the carbohydrate, but rather the alcohol on the anomeric carbon of the carbohydrate, and would therefor still have the primary alcohol function available for an oxidation reaction. One of ordinary skill in the art would have a reasonable expectation of success in oxidizing compounds which have the same reactive primary alcohol group and which are in the same class of compounds, being carbohydrates, and more specifically glucans, with the same reactants/steps and obtaining equivalent results.

Dependent claim 8 of the instant application and dependent claim 7 of copending '596 both provide limitations which are of no patentable import on the process as claimed. Limitations of the structure of a product in a process claim have no patentable import. However, in an effort to provide compact prosecution, if applicants were to amend the claims wherein the limitations of the product were of patentable import, the claims would be obvious variants of each-other. Claim 8 of the instant application is drawn the process as set forth in claim 1 wherein a carbonyl-containing carbohydrate containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule being produced. Claim 7 of copending '596 is drawn to the process of claim 1 wherein a cellulose derivative containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule is produced. One of ordinary skill in the art

would expect the process as set forth supra to produce compounds which are the same wherein the only variant is based on the starting material, a carbohydrate or cellulose.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 10-15 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 31, 32, 34-36, and 39 of copending Application No. 09/914,182 ('182). Although the conflicting claims are not identical, they are not patentably distinct from each other because both applications are drawn to oxidized carbohydrates which are not patentably distinct.

Independent claim 10 of the instant is drawn to an oxidized carbohydrate being selected from disaccharides, oligosaccharides and polysaccharides of the alpha-glucan, mannan, galactan, fructan, and chitin types and carbohydrate glycosides, containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule and further containing carboxyl and/or carboxymethyl groups. Independent claim 31 of copending '182 is drawn to an oxidized carbohydrate being selected from disaccharides, oligosaccharides and polysaccharides of the glucan, mannan, galactan, fructan, and chitin types and carbohydrate glycosides, containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule. Dependent claim 36 of copending '182 adds the limitation of the oxidized carbohydrate further containing carboxyl and/or carboxymethyl groups. It would have been obvious to one of ordinary

skill in the art that these oxidized carbohydrates are substantially overlapping, wherein the claims of '182 and the claims of the instant encompass a broad class of compounds, wherein the only species not encompassed by both is that of the beta-glucan type.

Dependent claim 11 of the instant application and dependent claim 32 of copending '182 both provide the limitation wherein the carbohydrate contains at least 5 monosaccharide units per average molecule.

Dependent claim 12 of the instant application and dependent claim 34 of copending '182 both limit the oxidized carbohydrate wherein at least part of the carbaldehyde groups has been converted to a group with the formula –CH=N-R or CH_2-NHR, wherein R is hydrogen, hydroxyl, amino, or a group R^1, OR^1, or NHR^1, in which R^1 is C_1-C_{20} alkyl, C_1-C_{20} acyl, a carbohydrate residue, or a group coupled with or capable of coupling with a carbohydrate residue.

Dependent claim 13 of the instant application and dependent claim 35 of copending '182 both limit the oxidized carbohydrate wherein at least a part of the carbaldehyde groups has been converted to a group with the formula –CH(OR^3)-O-CH_2-$COOR^2$ or –CH(-O-CH_2-$COOR^2$)$_2$, in which R^2 is hydrogen, a metal cation or an optionally substituted ammonium group, and R^3 is hydrogen or a direct bond to the oxygen atom of dehydrogenated hydroxyl group of the carbohydrate.

Dependent claims 14 and 15 of the instant application limit the oxidized carbohydrate claims 12 and 13 wherein the carbohydrates further contain carboxyl and/or carboxymethyl groups. It would have been obvious to one of ordinary skill in the art to incorporate this

limitation in the claims, as it is well known in the art that primary alcohols are oxidized to aldehydes and then further to acids, therefor comprising carboxyl groups.

The methods and compounds of the instant application must contain new and non-obvious variations over the copending applications to be patentably distinct.

This is a provisional obviousness-type double patenting rejection.

Claim Objections

Claim 2 is objected to because of the following informalities: the claim reads "wherein **a** **the** nitroxyl compound...". Appropriate correction is required.

Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In the instant case, claim 8 is drawn to a carbohydrate product, but the claim from which it depends, claim 1, is a method of producing nitrosonium ions, not carbohydrates.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite wherein the claim does not provide any steps. This is a process claim drawn to producing nitrosonium ions, but there are no active steps in the process to describe a process. Clarity is required.

Claim 6 is indefinite where the claim does not provide any steps. This is a process claim drawn to oxidizing a carbohydrate with an oxidizing agent in the presence of nitrosonium ions, but there are no active steps in the process describing the process.

Claims 7 and 10 claim a compound or a derivative thereof. In the absence of the identity of moieties intended to modify an art recognized chemical core, described structurally or by chemical name, the identity of a derivative would be difficult to ascertain. In the absence of said moieties, the claims containing the term "derivative" are not described particularly sufficiently to distinctly point out that which applicant intends as the invention.

Claims 8 and 11 are indefinite wherein the claims recite "per average molecule". It is unclear as to what meant by "per average molecule". There are no groups defined wherein an average could be obtained, and averages can be determined by various forms, i.e. mean, median, mode. Clarity is required.

All instances wherein "cyclic monosaccharide chain group" occur, i.e. claim 8, are indefinite. It is unclear what is meant by "cyclic monosaccharide chain group". It is unclear how a cyclic monosaccharide can be a chain group. Clarity is required.

Claim 9 recites the limitation "the carbohydrate" in the first line. There is insufficient antecedent basis for this limitation in the claim as this claim depends from claim 1, which does not have a carbohydrate.

Claim 12 is indefinite wherein the claim reads "at least a part of the carbaldehyde groups has been converted...". Is part of the carbaldehyde group converted, i.e. R-COH → R-COOH, or are only a portion of the carbaldehyde groups on the saccharide converted? Clarity is respectfully requested. Additionally, if the claim reads as a portion of the carbaldehyde groups on the saccharide being converted, the claim does not properly depend from claim 10, as at least part of includes converting all of the carbaldehyde groups, therein leaving none left and being in improper dependency.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 2 recites the broad recitation "a di-tert-nitroxyl compound", and the claim also recites "especially... TEMPO" which is the narrower statement of the range/limitation.

All claims which depend from an indefinite claim are also indefinite. ***Ex parte Cordova, 10 U.S.P.Q. 2d 1949, 1952 (P.T.O. Bd. App. 1989).***

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by BeMiller et al. (US Patent 3,632,802).

The claims of the instant application are drawn to an oxidized carbohydrate containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and further comprising carboxyl and/or carboxymethyl groups. Further, the oxidized carbohydrate contains at least 5 monosaccharide molecules.

BeMiller et al. teach to oxidize starch (which contains thousands of monosaccharide units) with chromic anhydride or with sulfuric acid thereby introducing aldehyde, ketone, and carboxyl groups (column 2, lines 3-7). The recitation of an oxidized starch with aldehyde, ketone, and carboxyl groups reasonably describes the compound claimed as this indicates that the aldehyde groups are obtained by oxidizing a primary alcohol function on the anomeric carbon, and additionally, some are further oxidized to carboxyl groups. The ketone groups are the result of the C2 and C3 alcohol groups (2,3-glycol group) being oxidized.

Since the Office does not have the facilities for preparing the claimed materials and comparing them with prior art inventions, the burden is on Applicant to show a novel or unobvious difference between the claimed product and the product of the prior art. See ***In re***

***Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977)** and ***In re Fitzgerald et al.*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980).**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Traviss McIntosh whose telephone number is 703-308-9479. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 703-308-4624. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Kathleen Fonda
Primary Patent Examiner
Art Unit 1623

Traviss C. McIntosh
March 12, 2003